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Sri Lanka Institute of Information Technology

B.Sc. Eng. (Honours) Degree

Mid-Term Examination
Year 2, Semester I (2016)

EC2491 – Object Oriented Programming

Duration: 1 Hour

March 2016

Instructions to Candidates:

- Answer **ALL** questions.
- There are 10 MCQ questions, and 2 Questions that require written answers.
- Each MCQ question carries 2 marks each. The written questions carry different marks. The total of marks for all questions is 30.
- This paper contains 6 pages with Cover Page. No additional data is attached.
- Write your answers on this paper itself.
- This midterm paper will be graded out of 30. The midterm contributes 30% of the marks towards the final grade.

Unless otherwise stated, **underline the most suitable answer.**

1. Which of the following is available in Java?
   a) Free functions (methods) outside any class.
   b) Global variable's.
   c) Switch statements.
   d) Symbolic constants as in 'C' (#define)

2. Inspect the following code:

```
class test{

      static int x=0;
      int y=0;

      public static void main(String args[]){
            test s1=new test();
            test s2=new test();
            s2.x=4;
            s2.y=5;
            System.out.println("s1:("+s1.x+","+s1.y+")");
            System.out.println("s2:("+s2.x+","+s2.y+")");
      }
}
```

The above code prints:

a) s1:(4, 0) s2:(4, 5)
b) s1:(0, 0) s2:(4, 5)
c) s1: (4, 5) s2: (4, 5)
d) s1:(4, 4) s2:(5, 5)

3. Java has two types of datatypes.

   A) primitive data types.
   B) Reference/Object data types.

   Select the answer from the list below which is **NOT** correct.

   a) Memory is allocated for reference datatypes on the heap.
   b) Memory is allocated for object datatypes on the heap.
   c) String literals (eg. "abcd") are allocated memory in the "string constant pool" which is created on the stack.
   d) String literals (eg. "abcd") are allocated memory in the "string constant pool" which is created on the heap.

4. Select the **CORRECT** statement relating to Java strings below:
   a) Java Strings cannot be modified once created (are immutable.)
   b) Java Strings can be modified (are mutable)
   c) When a java string is created by concatenation of 2 exiting strings, the new string will have the same object reference as the 2 source strings.
   d) Strings are a primitive data-type in Java.

Use the following code to answer the questions 5 and 6.

```
class array1{
      public static void main(String args[]){
      int a[] = {1,2,3,4,5,6,7,8};
      int []  b;
      b=a;

      for(int i=0; i< b.length; i++){
            b[i]=b[i]+1;
      }
      for(int i=0; i < a.length; i++){
            System.out.println("a[" + i + "]=" + a[i] );
      }
      for(int i=0; I < b.length; i++){
            System.out.println("b[" + i + "]=" + b[i] );
      }
}
```

5. the above code uses the following 2 lines: based on these 2 lines, select the appropriate answer.

```
int a[];
int [] b;
```

a) The first line above is an array. The Second line is an array object reference.
b) Both lines above are array object references.
c) The first line above is an array object reference, the second line is an array.
d) Both these lines declare arrays.

6. With reference to the two println() statements in the above code, select the **correct** answer.

a)Both statements will print the same output, because both print the same array object.
b) The statements will print different output, because the array object references are different.
c) The second println statement, prints different values than the first println, as the first for loop changes the contents of b[] but not a[] .
d) The second println statement should have printed b[i+1] rather than b[i].

7. Java has 4 Access modifiers: ***public***, ***private***, ***default*** and ***protected***. Select the **correct** answer from the list below.

a) if a class is declared ***private***, then only other classes in the same package can access it.
b) If no access modifier is specified, then the ***default*** access modifier is used.
c) If a variable inside the main routine of a class is declared ***public***, then that variable can be accessed by other methods in that class.
d) A class with ***default*** access can be accessed from another class in a different package.

Use the following code to answer the questions 8 and 9.

```
class Calculation{
    void add(int a,int b){
        System.out.println("int :"+ (a+b));
    }
    void add(long a,long b){
        System.out.println("long :"+ (a+b));
    }

    public static void main(String args[]){
        Calculation obj=new Calculation();
        obj.add(3, 3L);
        obj.add(20,20);
    }
}
```

8. The above code :
   a) will not compile.
   b) Will have a runtime error.
   c) Will compile correctly and run.
   d) Will ask for user input at run time.

9. With reference to above code **write a method** that will be called for the following statement:

   obj.add(2.0,10,10); **4 Marks**

Use the following code to answer the questions 10 and 11.

```
public class B{
    private int data;
    B(){
        data=1;
    }
    B(int d){
        data=d;
    }
    void print(){
        System.out.println("data:"+data);
    }
}

class A{
    public static void main(String args[]){
        B b1=new B();                                    // Line A

        System.out.println("data:"+ b1.data);           // Line B
        b1.print();                                      // Line C
    }
}
```

10. Choose the correct answer.

a) This code prints : data:1
b) Compile error in // Line A
c) Compile error in // Line B
d) Compile error in // Line C

11. Choose the answer which is **NOT correct.**

a) **class B** sets it's fields to ***private*** access. This means that the fields can be accessed only via **class B**'s methods.
b) As **class A** is in the same physical file as **class B, class A** can access any data field or method belonging to **class B**, even if those fields or methods are marked as ***private.***
c) Even though **class B** does not have a main() method, **class B** can be compiled.
d) As **class B** is declared public, the code containing **class A** and **class B** has to be included in a file called **B.java**

12. Show how this code works by filling in the comment line in front of each code statement.
Simply indicate what is in string t. **6 Marks**

```
class string2{
   public static void main(String args[]){
        // Creating strings
        String s = " students ";
        String t = 2 + 5 + s;          // t has :_____
          t+= "out of ";               // t has :_____
             t = t + 2 + 5;            // t has :_____

     System.out.println(t);           // output : _____

   }
}
```